CR–209209


# Extrasolar Research Corporation

720 Magnolia Avenue, Pasadena, CA 91106-3624
626 568-9702 / FAX 213 477-2701


02/04/99

Re: NAS5-97066

Publication and Graphics Services Division
Goddard Space Flight Center, Code 253.1
Greenbelt, MD 20771

Dear Publication and Graphics Services Division,

Enclosed please find the item "NAS5-97066 Quarterly Report 6 of 8". An invoice for this item has been sent at this same time to the Financial Management Division.

With best regards,

Susan Terebey

Dr. Susan Terebey

Notes:

Contract Specialist: Loren Kruger
Code 216
301 286-2028

Shipped to: Contracting Specialist (1 copy), Contracting Officer's Technical Representative (1 copy), Publication and Graphic Services Section (1 copy), and Center for AeroSpace Information (2 copies).

**NAS5-97066 Quarterly Report 6 of 8**

**4 February 1999**

# PROGRESS REPORT FOR ASTROPYSICS DATA PROGRAM CONTRACT NAS5-97066

**by S. Terebey, Extrasolar Research Corp.**

Progress report for the astronomy research proposal entitled "The Contribution of Ionizing Stars to the Far-Infrared and Radio Emission in the Galaxy"

by Dr. S. Terebey (PI), Extrasolar Research Corp., Pasadena CA,
Dr. M. Fich (co-I), Dept. of Physics; Univ of Waterloo, Waterloo CAN
Dr. R. Taylor (co-I), Dept. of Physics and Astronomy; Univ. of Calgary, Penticton CAN

## PROGRESS THROUGH 1998 QUARTER 4, May 98 - Jan 99

The manuscript entitled "Cross Log Entropy Maximization and Its Application to Ringing Suppression in Image Reconstruction," by authors Dr. Yu Cao of Caltech, Dr. Paul Eggermont of University of Delaware, and Dr. Susan Terebey has been accepted by IEEE Transactions on Image Processing and is due to appear in print February 1999 in Volume 8, Issue 2.

Terebey continued analysis work on the W4 HII region, investigating a model where vigorous stellar winds are responsible for evacuating a cavity, pushing the interstellar material outward into a thin exterior shell. During this period the analysis reached a sufficiently mature stage that Terebey started writing a research manuscript, provisionally entitled "Radio and Infrared Images of the W4 Supershell".

Early in the period Terebey attended the Canadian Galactic Plane Survey Science Meeting held May 4-5 at Queen's University in Kingston, Ontario. The trip also contained a research visit with co-investigator Dr. Michel Fich at the University of Waterloo to discuss the development of HII region models.

Co-investigator Dr. Michel Fich visited Terebey in Pasadena on January 13, 1999 to discuss the W4 research. Dr. Fich reported on the status of the HII region models which include interstellar dust which are being developed by astronomy graduate student Mr. Greg Poole.

## PROBLEMS FOR CURRENT PERIOD

The scope of the current task turned out to be more complex than initially anticipated due to the large size of the image database. During the current period time was spent writing analysis software which is specific to modeling HII region images. The problem was compounded by having to port the early version of the software to the current computer system. The software problems are largely solved and should not cause any future delays.

## PLANS FOR 1999 QUARTER 1

Next quarter's goals are to make progress in the following area of the W4 HII region research:

1. Continue work writing a draft manuscript "Radio and Infrared Images of the W4 Supershell" which summarizes the main results of fitting the southern W4 loop using a wind-blown shell model.

2. Perform the quantitative calculations which are to be quoted in the text for the derived radio and infrared parameters such as optical depth, temperature, and luminosity.

3. Do a background literature search to identify additional technical papers which are relevant to the manuscript.